

Foreign Portfolio Investment and Economic Growth in Nigeria Democratic Settings

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Abstract

The study examined the relationship between foreign portfolio investment, democracy and economic growth in Nigeria. This was with a view to explore the nexus between foreign portfolio investment, democracy and economic growth in Nigeria. Secondary data were used in this study. Annual time-series data for the period 1986 to 2013 on foreign portfolio investment and maximum lending rate were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin, while data on variables such as GDP growth rate and gross domestic savings were obtained from World Development Indicators (WDI) database, published by the World Bank. Data collected were analyzed with both descriptive statistics and econometric techniques. Time series properties of the variables were examined using both Augmented Dickey Fuller and Phillip Peron tests. Cointegration properties of the variables were also examined. Vector Auto-Regressive technique supported by Variance Decomposition and Impulse Response analysis were employed to empirically determine the relationship between foreign portfolio investment

and economic growth in Nigeria. The results showed that foreign portfolio investment inflow was more stable in democratic periods between 1999 and 2013 than the military periods between 1986 and 1998 and that the correlation between economic growth and foreign portfolio investment is positive and very significant. The result showed that in the longrun foreign portfolio investment had positive and significant effect on the economic growth in Nigeria ($t = 3.7$, $p < 0.05$). It also showed that democracy had a positive and significant effect on economic growth ($t = 2.7$, $p < 0.05$), while it has positive but not significant effect on the relationship between foreign portfolio investment and economic growth ($t = 1.92$, $p > 0.05$). This study therefore concluded; the impact of foreign portfolio investment on economic growth was very large and significant in the longrun; that democracy in itself affected economic growth significantly and positively but democratic government had no significant effect on the relationship between foreign portfolio and economic growth.

Keywords: Democracy, Foreign Portfolio Investment, Economic Growth:

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1 INTRODUCTION

Nigeria centenary celebration coincided with the emergence of Nigeria as the largest economy in Africa leaping from a GDP size of about N260 billion in the year 1990, about N5 trillion in 2000 to a GDP of about N34 trillion in 2010 and at about N81 trillion in 2013 (CBN, 2014). This makes the country at par with those countries like Argentina and Austria. Towards this end, Government had instituted several policies/incentives aimed at creating a sustainable business environment that would enhance the global competitiveness of the economy and make it the preferred investment destination in Africa. This required a multi-faceted approach both internally and externally via fiscal, monetary and foreign exchange management to achieve favourable balance of payment in its international transactions.

Increases in foreign portfolio investment in recent times have stimulated intense debates about its impact on Nigeria economic growth. Proponents emphasize its positive impacts on growth and financial sector development while critics express concern about its volatile nature whose instability could be unsustainable and adversely affect the financial sector of the economy. Foreign portfolio investment as part of financial and capital account of balance of payments consists of equity securities, debt securities in the form of bonds and notes, money market instruments and financial derivatives. IMF (1993) defined foreign portfolio investment as equity and debt issuances including country funds, depository receipts and direct purchases by foreign investors of less than 10% control. To put it simply, foreign portfolio investment is a cross-border investment in securities with the intention of profit-making rather than management or legal control.

Nigeria democratic system has been consistently interrupted since independence, military ruled the country consistently for seventeen years between 1983 and 1999, some political economist saw this as a bane to the economic growth of the country and they perceived the recent growth in the economy as a product of political development in the economy. The relationship between economic growth and democracy had attracted much discussion in the literature. However, the researchers have not come up with an exact answer to question of whether democracy promotes or prevents economic growth and the direction of relationship between them is yet to be established. So far consensus has not been reached on this issue, more so there is no clear theoretical evidence as regards the relationship between democracy and foreign portfolio investment as well as other foreign resource flow. Thus the relationship between democracy and economic growth is one of the widely disputed

issues in the literature.

Conventionally, democratic governance is more acceptable worldwide and thus enhances investor's confidence in an economy. This is because democracy is expected to reduce arbitrariness of government, provides lower risk of policy reversal, strengthens property right protection (Norht and Weingast, 1989; Li, 2009) and finally makes the country friendlier to the rest of the world. In addition, Nigeria transition from military to democratic rule in 1999 may also serve as a door opener for international investors who may seize the opportunity to diversify their investment into the economy.

Ekineh (2003), discovered that the investment climate in Nigeria for the period 1987 to 1998 was uncondusive, leading to a spate of divestment even by the nation's traditional and long standing investors, who perhaps moved to more favourable environments. During military regime, between 1989 and 1999, net foreign portfolio flow to Nigeria was negative all through except 1992. However, with the onset of democratic governance in 1999, foreign portfolio inflow jumped from N1 billion to N51.1 billion naira in 2000, the net foreign portfolio flow has since been consistently positive to about N2 trillion in 2013.

A corpus of studies has shown that the theoretical divide on the impact of democratic versus authoritarian regimes on growth is matched by ambiguous empirical results, resulting in a consensus of an inconclusive relationship. These positions necessitate the interest of this study to establish the world perspective of Nigeria political system as it relates to the inflow of foreign portfolio investment and its significant effect on the economic growth of the country as Nigeria is currently rated the best economy in the continent. This study therefore examines; the impact of democracy on economic growth; the impact of foreign portfolio investment on economic growth and the impact of democracy on the relationship between foreign portfolio investment and economic growth of Nigeria.

Following this introduction, the next section reviews the empirical evidences on the relationship between foreign portfolio investment and economic growth. Section three considers issues on data and methodology, while section four consists of the empirical findings and discussions. Last section contains conclusion, policy implications and recommendations.

2 Empirical Evidences

Several studies have examined the positive and negative effect of democracy on economic growth and answer the question of whether democracy facilitates or prevents economic growth. Among these studies are Bhagwati (2002) and Kurzman et, al (2002) which examined questions on; whether the poor countries are facing with a cruel trade-off between democracy and economic growth; whether there is a win-win relationship between democracy and economic growth whether democracy and economic growth are irrelevant?

Keskin, (2011) sees democracy as a climate in which both economic development and social capital raises a precondition for economic development. Bhagwati, (2002) posits that democracies affect the quality of administration positively. Rodrik (1999), Lake and Baum (2001), Baum and Lake (2003) observed that democracies can limit state intervention in the economy and that democracies are responsive to public's demands on areas such as education, justice and health, and encourage stable and long-run growth.

While considering investment, Kruzman et. al, (2002) submits that investment will grow in a climate of liberty, free-flowing information, and property rights secure from the arbitrary power of the state. Political freedoms will increase free trade and reduce protective policies by enlarging economic freedoms in democracies and that free trade is less observed in authoritarian regimes due to the dominance of autarchy. As a result of the likelihood of changing the rules of the game of economic activities arbitrarily in the authoritarian regimes, this unexpected situation makes investors less willing to invest and this influences growth negatively.

In other way, studies have also espoused the fact that democratization is not likely to be helpful for the task of economic development (Sachs, 2005 and Collier, 2009). Overseas Development Institute (ODI) in Britain sponsored research on low-income country governance, these studies argued that multi-party electoral democracy is likely to have a negative effect on governance and economic growth (Booth, 2012; Kelsall and Booth, 2013). Multi-party electoral systems in the region are often derided as corrupt and clientelist, and their prospects for economic growth contrasted unfavorably with those of autocratic regimes like Angola and Rwanda.

The good performance of some Asian countries (Hong Kong, Singapore, South Korea, Taiwan and China) in terms of economic growth is in contrast with the arguments for the conduciveness of democracy to economic growth and shows that undemocratic countries can also achieve economic growth (Haan and Siermann, 1995; Bhagwati, 2002 and Drury et al., 2006).

Moreover multinational corporations may prefer to invest in autocratic countries; this is because autocratic governments are more than often irresponsible and unaccountable to their citizens. As a consequence, autocratic government collaborate with multinational companies to exploit others, provide more generous incentive packages and also offer protection from labour unions (Li and Resnick, 2003).

Huntington (1968) argues that democracies have weak and fragile political institutions and lend themselves to popular demands at the expense of profitable investments. It was further argued that democracies;

lend themselves to popular demands for immediate consumption at the expense of profitable investments, cannot be insulated from the interests of rent-seekers and cannot mobilize resources swiftly (Krueger 1974, Bhagwati 1982). Non-democratic regimes can implement coercively the hard economic policies necessary for growth, and suppress the growth-retarding demands of low-income earners and labour in general, as well as social instabilities due to ethnic, religious, and class struggles. Democracies cannot suppress such conflicts. Therefore, for economic progress, markets should come first and authoritarian regimes can easily facilitate such policies.

In essence, while some authors favor authoritarian regimes to suppress conflicts, resist sectional interests and take coercive measures necessary for rapid growth, others remain overall skeptical on whether regimes, rather than markets and institutions, matter for growth (Bhagwati 1995). The proponents of this view argue that it is the institutional structure and organizations, rather than regimes per se, that matters for growth. Pro-growth governmental policies can be instituted in either regime. A sound leadership that will resolve collective action problems and be responsive to rapidly changing technical and market conditions is more essential for growth (Bardhan 1993).

Barro (1996) and Doucouliagos and Ulubaşoğlu (2008) conceptualized democracy as “political democracy” and “economic democracy” in the analysis of the relationship between democracy and economic growth. While multi-party system, free elections, freedom of press, democracy; free market, guarantee of the right of private ownership, minimisation of the public share in economic activities, freedom in the activities of business and credit system, regulation on labour market, economic rights and freedoms constitutes main tenets of economic democracy. These studies concluded that while political democracy have an indirect positive effect on economic growth, economic democracy have direct and positive effect on economic growth though there is no clear distinction between political democracy and economic democracy. While defining the relationship between market economy (economic democracy) and democracy (political democracy); it should be stated that market is necessary condition for democracy, but not enough, on the other hand democracy is not a precondition for market economy (Yay, 2002).

As regards the relationship between foreign portfolio investment and economic growth, despite the little attention on studies relating foreign portfolio investment to growth in Nigeria, there are numerous studies on the relationship between foreign capital flow and economic growth in many economies of the world and much has also been done on this relationship in Nigerian context. Moreover there are series of attempt to rationalize financial integration from economic growth perspective (Quinn, 1997; Levine, 2001; Bekaert et al, 2005; Bussiere and Fratzscher, 2008; Honig, 2008; Butkiewicz and Yanikkaya, 2008; Klein and Olivei, 2008; Chambet and Gibson, 2008). Studies are also abound on the relationship between foreign portfolio flow and capital market (Errunza, Orji, 2014) as well as relationship between capital market and growth (Aiguh, 2009; Idolor, and Erah, 2011; Roseline and Anne, 2013; Okoye and Nwisiyenyi, 2013; Owolabi and Ajayi, 2013). The simple conclusions derived are first, that financial integration promotes economic growth. Second, foreign portfolio investment leads to growth in 2005; Ozurumba, 2012; Eniekezimene, 2013; Guluzar and Bener, 2013; Olotu and capital market and third, capital market promotes economic growth. However, as sound as these arguments, we cannot conclude transitively that foreign portfolio investment promotes economic growth in the economy. This is because four other channels were identified through which foreign portfolio flow into the economy (Giyas 2007), this will amount to attributing the whole inflow to the domestic capital market alone.

As much as there are numerous studies on the relationship between economic growth and foreign capital flows (Adam, 2002; Dhingra, 2004; Ghose, 2004; Baharumshah and Thanoon, 2006; Bordo and Meissner, 2007; Prasad et. al, 2007; Tokunbo and Lloyd, 2010; Orji and Mba, 2011; Osuji and Akinjuobi, 2013; Simon and Olayemi, 2014), studies on the relationship of economic growth with foreign portfolio investment are relatively low and there are still much to explore on this relationship. Most of the studies on this relationship are cross sectional studies and mostly agreed that foreign portfolio investments are insignificantly and negatively related to growth (Durham, 2003; Dimitrios et.al, 2005; Houssem and Hichem 2011). The need for specific study on the relationship between foreign investment and economic growth in Nigeria context spurs this study.

3 Data and Methodology

3.1 Theoretical Framework

The classical theory was not developed into a growth theory but the underlying consistency is such that one may conclude that the classical were also interested in the state of the economy of their time. One logical extension of the Classical ideas is the neoclassical growth model. An alternative theoretical perspective on growth process is the well-known Harrod-Domar growth model, which is more grounded in Keynesian thought. Thus, this study is based on the Harrod-Domar growth model as expanded by Chenery and Strout (1966) two-gap model that growth process depends on accumulation of physical capital. According to Harrod-Domar growth model, investment is the key to growth. Chenery and Strout introduced foreign sector on the ground that savings from foreign countries in form of capital flow to domestic economy can be utilized by developing countries to supplement the domestic savings and the foreign exchange. Indeed, Chenery and Strout in the two-gap model

may be right that foreign capital serves as catalyst in growth process. However, the technicality of how foreign savings and domestic savings translate into growth in the longrun is lacking in the model. In this model, growth is endogenous, that is, the entire growth process is determined by the action of the economic agents described in the model. This endogeneity of A-k model prioritized it over exogenous model like Solow's model. Exogenous growth model described the process leading to economic growth as a function of improvement in total factor productivity (technological progress) without concrete explanation about where the improvements come from which economist term 'exogenous growth'. Moreover, the exogenous growth model shared a common implication that changes in government policies, such as subsidies to research or capital investments do not have longrun growth effects. In contrast, the term endogenous growth can be further interpreted as;

1 the economy longrun growth is not influenced by any exogenous factor, such as exogenous technological progress. Rather the longrun growth rate depends on the decisions of the economic agents.

2 Government policy can influence the economy's longrun growth rate. The production function of the Cobb – Douglas form is adopted with some modification based on recent research directions on empirical growth.

$$Y = A K_t^\alpha L_t^{1-\alpha} \quad 1$$

To begin with, the capital stock is assumed to consist of two components: domestic (K_d) and foreign owned (K_f) capital stock. So, $K_t = K_d + K_f$

However, we specify domestic and foreign owned capital stock separately in a Cobb–Douglas production function (Cobb and Douglas, 1928) as follows.

$$Y = A_t K_{dt}^{\alpha_1} K_{ft}^{\alpha_2} L_t^\lambda \quad 2$$

where Y is the flow of output, K_{dt} , K_{ft} represent the domestic and foreign owned capital stocks, respectively, L_t is the labour, and A_t is the total factor productivity, which explains the output growth that is not accounted for by the growth in factors of production specified, and

$$\alpha_1 + \alpha_2 = \alpha$$

$$\lambda = 1 - \alpha$$

If we assume A_t to be constant but greater than zero ($A_t > 0$) and $\alpha = 1$, and we further assumed that there is no population growth in the model; therefore, the overall output is equal to per capita output.

We have;

$y_t = k_{dt}^{\alpha_1} k_{ft}^{\alpha_2}$ Taking logs and differentiating Equation 2.6 with respect to time, we obtain the familiar growth equation:

$$y_t = \alpha_0 + \alpha_1 k_{dt} + \alpha_2 k_{ft} \quad 3$$

where log represent the growth rates of output, domestic capital stock, and foreign capital stock, and, α_1 , and α_2 represent the elasticity of domestic capital stock, and foreign capital stock respectively.

In a world of perfect competition and constant returns to scale, these elasticity coefficients can be interpreted as respective factor shares in total output. Equation 3 is a fundamental growth accounting equation, which decomposes the growth rate of output into sum of the growth rates of capital stocks (both domestic and foreign). Theoretically, α_1 and α_2 are expected to be positive.

3.2 Models Specification

Follow from the theoretical framework, the model formulation for this study will be based on the augmented production function in which capital stock and other endogenous factors jointly determine the level of productivity. One of these endogenous factors is foreign portfolio investment. Therefore, the models that would be estimated in the course of this quantitative variables research are as stated below:

$$y_t = c + c_1 K_{dt} + c_2 K_{ft} + c_3 X_t + E_i \quad 4$$

accommodating the interaction between democracy, and 1995 policy measure, with foreign portfolio investment, the above equation will be stated as follow;

$$Y_t = \alpha + \beta_1 K_{dt} + \beta_2 K_{ft} + \beta_3 X_t + \gamma_1 D_{11} + \delta_{11} (K_{ft} D_{11}) + \epsilon_i \quad 5$$

Where;

Y_t – growth rate of Gross Domestic Product at time t

K_{dt} - domestic investment at time t

K_{ft} - foreign portfolio investment at time t

X_t - interest rate at time t as control variable

D_{11} - dummy variable regressor for political regime shift of 1999

$K_{ft} D_{11}$ - regressor of foreign portfolio investment interaction with political regime shift of 1999

$\alpha, \beta_1, \beta_2, \beta_3, \gamma_1, \gamma_2, \delta_{11}, \delta_{12},$ - Constants ϵ_i - Error term

Theoretically, β_1 and β_2 , are expected to be positive, while β_3 is expected to be negative. Interest rate is expected to have negative relationship with the economic growth as submitted by (Chete, 1998) that maximum lending rate would raise the cost of capital and therefore dampen foreign portfolio investment especially those requiring some infusion of domestic capital.

3.2.1 Stationarity Test

The non-stationary nature of most series data and the need for avoiding the problem of spurious or nonsense regression calls for the examination of their stationary property. In first stage, stationary of series on each variable is examined using both Augmented Dickey-Fuller test and Phillips-Perron (PP) tests. The Dickey-Fuller test involves estimating regression equation and carrying out the hypothesis test. To show the Dickey-Fuller (DF) test, the AR (1) process is shown.

$$Y_t = \alpha + \rho \cdot Y_{t-1} + \varepsilon_t \quad 6$$

Where α and ρ are parameters and ε_t is a white noise. Y is stationary, if $-1 < \rho < 1$; if $\rho = 1$, y is non stationary and if the absolute value of ρ is greater than one ($\rho > 1$), the series is explosive. Therefore, the hypothesis of a stationary series involves in whether the absolute value of ρ is strictly less than one ($\rho < 1$). The test is carried out by estimating an equation with Y_{t-1} subtracted from both sides of equations.

$$Y_t = \alpha + \gamma Y_{t-1} + \varepsilon_t \quad 7$$

Where, $\gamma = \rho - 1$ and the null and alternative hypothesis are

$$H_0: \gamma = 0$$

$$H_1: \gamma > 1$$

The t-statistics under the null hypothesis of a unit root does not have the conventional t- distribution. Dickey-Fuller (1979) shows that the distribution is non-standard, and simulated critical values for the selected sample. Later, Mackinnon (1991) generalizes the critical values for any sample size by implementing a much larger set of simulations.

A stochastic process is said to be stationary if its mean, variance and covariance remain constant over time. The value of the covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which the covariance is computed. These conditions can be summarized as follows:

- i) $E(Y_t) = \text{Constant}$
- ii) $\text{Var}(Y_t) = \text{Constant}$
- iii) $E(Y_t, Y_{t+k}) = \text{Constant}$ for all t and all $k \neq 0$.

One advantage of ADF is that it corrects for higher order serial correlation by adding lagged difference term on the right hand side. The simple unit root test is valid only if the series is an AR(1) process. One of the important assumptions of DF test is that error terms are uncorrelated, homoscedastic as well as identically and independently distributed.

$$\Delta Y_t = \alpha + \gamma Y_{t-1} + \delta_1 \Delta Y_{t-1} + \delta_2 \Delta Y_{t-2} + \dots + \delta_p \Delta Y_{t-p} + \varepsilon_t \quad 8$$

This augmented specification is then tested for

$$H_0: \gamma = 0$$

$$H_1: \gamma > 1$$

Another unit root testing procedure that is commonly used is Phillips-Perron test (PPT) which was developed in 1988. Philip-Perron test supports the Dickey-Fuller tests in that, it assumes that the errors are statistically independent and have a constant covariance. They, however, used a generalization of the Dickey-Fuller procedure that allows for fairly mild assumptions concerning the distribution of the errors. The procedures are modifications of the Dickey-Fuller t-statistics that take into consideration less restrictive nature of the error process. To illustrate Philip – Perron (PP) approach, consider equation:

$$\Delta y_t = \alpha_0 + \sigma y_{t-1} + \varepsilon_t \quad 9$$

In the case of ADF test, it corrects for higher order serial correlation by adding lagged differenced terms on the right-hand side of the equation. The PP test, on the other hand, makes a correction of the coefficients in the equation 9 in order to account for the correlation. The asymptotic distribution of the PP “t” statistics is the same as that of the ADF “t” statistics, and thus the MacKinnon (1991) critical values are also applicable which is calculated by e-views software. Also, in the same way as with ADF tests, the PP test can be performed by including a constant, constant and trend or neither of the two in the regression. By testing both the unit root hypothesis and the stationarity hypothesis, we can distinguish between series that appear to be stationary, series that appear to have unit root, and series for which the data (or the tests) are not sufficiently informative to be sure whether they are stationary or integrated.” Joint testing of both nulls can strengthen inferences made about the stationarity or non-stationarity of a time series especially when the outcomes of the two nulls corroborate each other. This joint testing has been known as “confirmatory analysis.”

3.2.2 VAR Model Specification

This section presents the VAR model that is specifically made use of in this study. VAR methodology also known as unrestricted VAR as proposed by Sim (1980) is used in the first part of this analysis.

The Nigeria economy in the context of VAR is represented by the equation below:

$$Y_t = A(L)Y_t + B(X_t) + \varepsilon_t \quad 10$$

The equation above is a reduced- form equation which is derived from the structural equation. It shows the relationship between all the endogenous variables: economic growth, foreign portfolio investment, domestic savings and short term interest rate.

The structural equation for this model can be explained as:

$$GY_t = AY_{t-1} + BX_{t-1} + \varepsilon_t \quad 11$$

where, G represents all the coefficients describing the contemporaneous relationship among the variables. Matrix A includes all the coefficients describing the lagged relationship among all the variables, while matrix B shows all the coefficients describing the relationship between the endogenous variables and the exogenous variable, and encompasses the residuals. If equation 11 is multiplied by G^{-1} , it results in the equation below:

$$Y_t = G^{-1}AY_{t-1} + G^{-1}BX_{t-1} + G^{-1}\varepsilon_t \quad 12$$

This can then be written in a more reduced form as equation 10 above.

$$Y_t = A(L)Y_t + B(X_t) + U_t \quad 13$$

Dummies such as transition of regime in 1999, adoption of exchange rate policy of 1995 are included in the model to account for possible structural break in the system. These are represented by the following vector:

$$X_t = [D_1 \ D_1F] \quad 14$$

Where;

D_1 represents dummy-variable regressor for the transition of political regime in 1999 and is coded 1 from 1999 upward and 0 before 1999, D_1F represents interaction regressor between transition of political regime and foreign portfolio investment, the interaction regressor is the *product* of the dummy-variable regressor for transition of political regime and foreign portfolio investment.

The endogenous variables include gross domestic product, interest rate, domestic savings and net foreign portfolio investment. These are shown in the vector:

$$Y = [GDP \ FPI \ DS \ INT] \quad 15$$

Where;

GDP is the gross domestic product,

FPI is the net foreign portfolio investment,

DS is the domestic savings, and

INT is the interest rate.

This reduced form of the autoregressive model with multi-variable time series can be expressed as follows, where y_t is a j vector of endogenous variables, x_t is a k vector of exogenous variables, λ_i and μ_i are matrixes of coefficients to be estimated, and u_t is a j vector of error terms or impulses in the language of VAR:

$$y_t = \sum_{i=1}^Z \lambda_i y_{t-1} + \sum_{i=1}^Z \mu_i x_{t-1} + \gamma + u_t \quad u_t \sim IN(0, \Sigma), \quad 16$$

Since VAR models do not distinguish the dependent variables from the independent variables, the notation of y_t and x_t is conventional. Under the assumption that u_t is neither autocorrelated nor correlated with any of the right-hand side variables, we can appropriately estimate the coefficients by OLS. The number of lags m is again determined by Akaike information criterion (AIC), or Schwarz criterion (SC).

$$\Delta y_t = \mu + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{k-1} \Delta y_{t-k+1} + \Pi y_{t-k} + \varepsilon_t \quad 17$$

Equation (17) is simply an error correction representation of the VAR system embodied in equation (16), and shows how level of the endogenous variables in y enter short-term dynamics. The main concern of cointegration is to determine the rank of the long-run matrix Π ; the determination of maximum number of linearly independent columns in matrix Π . Since matrix Π is of order $n \times n$, the maximum possible rank is n and the minimum rank is zero.

Three interesting cases can be distinguished: (i) If the cointegration rank $r = 0$, then rank (Π) = 0 and the variables collected in Y_t are not cointegrated. In this case, there are k independent stochastic trends in the system and it is appropriate to estimate the VAR model in first differences, dropping Y_{t-1} as regressor in Equation (17). (ii) At the other extreme, if $r = k$, then rank (Π) = k and each variable in Y_t taken individually must be stationary. Or, in other words, the number of stochastic trends, given by $k - r$, is equal to zero. In this case, the system can be estimated by applying OLS either to the unrestricted VAR in levels (Equation (17)) or to its equivalent representation given by (18). (iii) In the intermediate case, $0 < r < k$, the variables in Y_t are driven by $0 < k - r < k$ common stochastic trends and rank (Π) = $r < k$. In this case, estimating the system given by (17) by OLS is not appropriate since cross-equation restrictions have to be imposed on the matrix Π . Instead, the maximum likelihood approach developed by Johansen (1988, 1991) can be applied in order to estimate the space spanned by the cointegrating vectors. Although the rank determination of the long-run matrix Π provides an answer as to how many linear combinations of variables in the system are $I(0)$, it requires to be supplemented by exogeneity and causality analysis to provide an economically interpretable linear relations.

Furthermore, we adopt an innovation accounting by simulating variance decompositions (VDC) and

impulse response functions (IRF) for further inferences. The unrestricted VAR are usually not so good in estimating short- term forecasts since they are over parameterized. However, the understanding of the properties of the forecast errors is extremely helpful in estimating interrelationship among the variables in the system (Enders 1995: 278). VDC and IRF serve as tools for evaluating the dynamic interactions and strength of causal relations among variables in the system. The VDC indicate the percentages of a variable's forecast error variance attributable to its own innovations and innovations in other variables. Thus, from the VDC, we can measure the relative importance of FPI fluctuation in accounting for the variations in real GDP and all other variables. Moreover, the IRF trace the directional responses of a variable to a one standard deviation shock of another variable. This means that we can observe the direction, magnitude and persistence of economic growth to variation in the FPI, other variables, and vice versa.

3.2.3 Impulse Response Functions

The most intuitive tool to analyze the interaction among variables in the system is the impulse response function for each of the series. To see this, by using recursive substitution we can write the unrestricted VAR in its Vector Moving Average (VMA) representation:

$$y_t = A_0 + \sum_{i=0}^{\infty} A_1^i e_{t-1} \quad 18$$

However, to trace the impact of an "impulse" to one of the variables on itself and on the rest of the variables in the system, what is required is the VMA representation based on the orthogonal structural shocks instead on the reduced form residuals, which are correlated with each other.

Now, by using the definition of e_t we can write the VMA representation of the VAR as:

$$y_t = A_0 + \sum_{i=0}^{\infty} A_1^i B^{-1} \varepsilon_{t-i} \quad 19$$

or in a more compact form, as:

$$y_t = A_0 + \sum_{i=0}^{\infty} \phi_1 \varepsilon_{t-i} \quad 20$$

By updating this equation we get the response of y_{t+1} to a one-unit impulse at time t . If we graph each element of ϕ_1 against i periods, we have the response of each variable in the system from the impulse to the different structural shocks.

3.3 Sources of Data

Secondary annual data are used for this study. Data on foreign portfolio investment and maximum lending rate are obtained from Statistical Bulletin published by the Central Bank of Nigeria (CBN), while data on variables such as GDP, GDP growth rate and gross domestic savings from 1986 to 2013 are obtained from World Development Indicators (WDI) data base published by the World Bank.

3.4 Definition and Measurement of Variables

GDP is measured as the growth rate of gross domestic product, FPI is measured as percentage of the ratio of foreign portfolio investment to gross domestic product, DS is measured as percentage of the ratio of domestic savings to gross domestic product and INT is measured as the maximum lending rate in the economy

4 Empirical Findings and Discussions

4.1 Overview of Foreign Portfolio Investment and Political Dispensations in Nigeria

The total net inflow into the economy was about N5.4 trillion between 1986 and 2013 and the average net flow was about N193 billion within these periods. The slope of foreign Portfolio investments during the military era between 1987 and 1998 was almost parallel to the X- axis which indicates that there was no significant improvement in the flow of foreign portfolio investment within these periods. The slope later improved after the end of the Asian crisis in 1998 and with the advent of democracy in Nigeria in 1999, this was maintained to 2004, only to collapse in 2005 and increased abruptly in 2006 through 2007 after sudden drop of 2005, but as the boom ended in 2007, foreign portfolio investment crashed to below zero between 2008-2009. The year between 2010 and 2013 witnessed a tremendous increase in the flow of foreign portfolio investment into the economy, these periods may be referred to as the boom period in the history of foreign portfolio investment in the country.

4.1.1 Pre Democratic Era

Pre democratic era in Nigeria consisted of shift from military to military regime between 1986 and 1999 with just three month interim civilian government intervention. General Ibrahim Babangida ruled the state between 1986 and 1993; Chief Earnest Shonekan headed interim government between august 1993 and November 1993, and General Sanni Abacha ruled between 1993 and 1998 while General Abubakar Abdsalam ruled between 1998

and 1999. As revealed in Table 1, Babangida regime was more disposed to foreign portfolio investment with net inflow of about N41 billion and average of about N5 billion within 1986 and 1993 despite negative inflow between 1989 and 1991. The periods between 1994 and 1998 were more favourable to the outflow of foreign portfolio investment at the expense of the inflow; these periods witnessed serious capita flight from the economy. Throughout these periods, there were more outflow of foreign portfolio investment than the inflow, the total net flow of foreign portfolio investment was about N23.5 billion with average of about minus N4.7 billion within these periods. This reflects the instability in the polity of the country, and the hostility of the rest of the world to the government of Nigeria as at these periods.

4.1.2 Democratic Era

This era marks a turning point in the flow of foreign portfolio investment in the country. The foreign portfolio investment flow to the economy within these periods positively skewed towards the inflow. Since the advent of democracy, there has been a huge inflow of foreign portfolio investment into the economy with the total net inflow of about N5.38 trillion. The average inflow between 1999 and 2013 was about N359 billion. These eras are sub divided into average of 4 years interval based on democratic arrangement of the country as shown in Table 2. The average net inflow continue to decrease with subsequent democratic dispensation from average of about N42 billion, N37 billion and N8.6 billion between 1999-2002, 2003-2006, and 2007-2010 respectively until the most recent dispensation between 2011 and 2013 with the average of about N1676 billion (N1.7 trillion), this may be due to the transformation agenda of president Goodluck Ebele Jonathan, which encompass restructuring and transformation of all the sector of the economy.

The growth of GDP during General Babangida regime was at a burst in 1987 as indicated in Fig1, just after the introduction of Structural Adjustment Program when its growth rate was less than zero, by implication there was depression in that year. The trend change just immediately after that year in 1988 with the rate of about ten percent growth in GDP, this trend continued in 1989 and 1990 with growth rate of about ten percent and seven percent respectively. The second military era between 1993 and 1998, led by General Abacha was not favourably disposed to the growth of GDP, the average growth then was about two percent within these periods.

For the first two years after the return to democratic rule in 1999, the Nigerian economy continued to report poor overall economic performance. It was widely expected that with the dawn of democratic revival in Nigeria, economic growth would resume and accelerate, leading to significant reduction in poverty. Unfortunately, this did not immediately happen and economic growth continued to be lacklustre and unprepossessing. This necessitates the actualization of the U.N.'s Millennium Development Goals (MDGs). Thus, starting from 2001, government started to introduce economic reforms. In 2003, the reform programme was formalized and systematized and government began to implement a comprehensive reform program known as the National Economic Empowerment and Development Strategy (NEEDS). However, the growth of GDP was at its boom in the period between 2003 and 2004, this was metamorphosed from about two percent in 2002 to about ten percent in 2003 and about eleven percent in 2004. This continued with the average of about six percent to the end of President Obasanjo's regime in 2007, the next administration of President Yaradua and President Jonathan witnessed the most consistence economic growth within the periods of 2007 and 2013 with the average growth rate of about seven percent.

4.1.3 Economic Growth and Foreign Portfolio Investment

Table 3 revealed that foreign portfolio investment and economic growth are positively correlated. This correlation is about 0.8 which indicate that they are strongly correlated as indicated by the t-statistic of about 6.3. The probability value of zero with the null hypothesis that the correlation between foreign portfolio investment and economic growth are not significant implies that this relationship is very significant.

4.2 Univariate Properties of the Variables

The Table 4 presents the results of the Augmented Dickey Fuller (ADF) and Phillip Perron test at level. It is evident from the results of Augmented Dickey Fuller (ADF) that all the variables were stationary at levels, that is, they were integration of order zero $I(0)$. To choose the appropriate lag length we generate statistics based on the Schwarz Information Criteria (SIC) automatically computerized from the system. The result based on PP test also indicate that all the variables are integrated of the order zero, i.e. $I(0)$. AR spectral - GLS detrended estimation methods were used, the test result were also based on Schwarz Information Criteria (SIC).

4.3 Multivariate Analysis

The result of the cointegration test statistics for the four-variables, GDP, FPI, INT, and DS is reported in Table 1.2 Appendix C indicates that four cointegrating vector exist. The null hypothesis that there is no cointegrating vector in the systems ($r \leq 0$), ($r \leq 1$), ($r \leq 2$) and ($r \leq 3$) were all rejected. The implication of this is that $r = 4$, which implies that there exist full rank and the system will be estimated by applying OLS to the unrestricted VAR in levels.

4.4 Stationarity and Stability in the VAR

Usually, in the first-order autoregressive equation i.e. $x_t = \beta_0 + \beta_1 y_{t-1} + \varepsilon_t$, the stability condition can only be achieved if β_1 is less than 1. If this condition is met, the equations are stationary and do not have a unit root. When data - generation process exhibits a random walk with infinite memory to shock, such model is said to have a unit root and the series is non-stationary. A VAR process is not different, because the presence of a unit root in the VAR model will render it unstable. In other words in the first-order autoregressive equation, all the eigenvalues of β_1 must have a modulus less than 1. The graph requires all points to be inside the circle to satisfy the stability condition.

It is obvious that the modulus of eigenvalues were less than one, and all the points lied inside the circle as revealed in fig 4 in appendix C, therefore, we can conclude that the model is stable. If a model is not stable any inferences drawn on its impulse response will be inconsistent. However, these tests must be combined with the test for normality, autocorrelation and heteroscedasticity test to ascertain that the regressions are not spurious.

4.5 Residual Autocorrelation Test

The assumption of uncorrelated residuals is a crucial one in the VAR framework. One reason is that all χ^2 and F-tests are derived under the assumption of independent errors. If the model does not have this desired property, then the distribution of the tests may be significantly distorted. The test for residual autocorrelation is a Lagrange Multiplier (LM) test of nth-order correlation with a small sample correction. The test is also asymptotically distributed as χ^2 with p^2 degrees of freedom. We perform the test with the aim of detecting potential seasonal autocorrelation left-over in the model. The null hypothesis of no serial autocorrelation is not rejected at 5% level of significance at lag 3 with prob (0.3996). This result does not suggest any significant left-over autocorrelation, even up to lag 12. This is shown in Table 8 in appendix C

4.6 Normality Test

In order to assess residual normality of the entire system, we report the Lutkepohl multivariate test. The Jarque-Bera test does not reject the hypothesis of multivariate normality at 5% level of significance with ($\chi^2(8)=2.514933$). We can further investigate the normality of residuals by looking at univariate tests. Both skewness and kurtosis tests do not also reject the null hypothesis of multivariate normality at five percent level of significance with ($\chi^2(4) = 0.506045$) and ($\chi^2(8)= 42.008888$) respectively. Moreover, since “VAR estimates are more sensitive to deviations from normality due to skewness [third moment around the mean] than to excess kurtosis [fourth moment]” (Juselius, 2007:77), it is also useful to report this information. The results reported at Table 9 in Appendix C do not seem to suggest serious violations of the normality assumption.

4.7 Heteroscedasticity Test

To evaluate whether the residuals have constant variance, we apply white heteroscedasticity test with no cross term test for joint and individual components of the residuals of each VAR equation. The test is approximately distributed as χ^2 , and R^2 is taken from an auxiliary regression. The null hypothesis is no cross term heteroscedasticity. The joint test does not reject the hypothesis of no cross term heteroscedasticity at 5% level of significance with ($\chi^2(110)=122.5021$). The individual components test of F-test and χ^2 test also do not reject the hypothesis of no cross term heteroscedasticity at 5 % level of significance. This result for the multivariate tests in Table 10 appendix C indicates no serious heteroscedasticity.

4.8 Foreign Portfolio Investment, Democracy and Economic Growth Interactions

The effect of foreign portfolio investment on growth rate of domestic product is positive as expected in lag 3. This conforms to Bordo and Meissner (2007), that there is the possibility that there were long and variable lags in the impact of foreign capital on economic growth. The essence of this is that the marginal propensity to invest in Nigeria portfolio from foreign country is about 1. The implication of this is that an increase of foreign portfolio investment by one billion naira in the economy will increase the growth rate of the economy by about one percent. This effect fails to materialize in the economy of the country until the third year. Williamson (1964), Cottrell (1975) and Eichengreen (1995) suggest there were long lags of ten to fifteen years between capital inflows and the real impact on the domestic economies of Canada and the USA. This result conforms to the a priori economic theory which postulates that increase in foreign portfolio investment will lead to increase in the economic growth.

An increase of the interest rate by 1 percent will reduce the growth rate of the economy by about 0.32 percent in the second year while an increase of domestic savings by one percent will increase the growth rate of the economy by 0.21 percent in the third year.

The result shows that in the long run foreign portfolio investment has significant impact on economic growth in Nigeria while in the short run; the impulse response showed in Appendix D that there is negative relationship between foreign portfolio investment and economic growth in Nigeria. This result supports the view

of Kaminsky and Schmukler (2001) that the benefits of FPI are long-term with some adverse effects in the initial stage of the process and that the long-term gains of FPI outweigh its short-term ill effects and bring real benefits to the growth and development of the domestic financial markets and the economy in general.

Table 5.6 Growth Model					
Variables	Effect	T-stat	Lag	Relationship	Inferences
FPI	1.002393	3.70184	3	Positive	Significant
Int	-0.321900	-3.34449	2	Negative	Significant
DS	0.214674	4.00616	3	Positive	Significant
D1	2.333336	2.65971		Positive	Significant
D1F	1.003932	1.91614		Positive	Insignificant

The effect of domestic savings on the economic growth is positive and significant in the longrun while the effect of interest rate is negative and significant in the longrun. The effect of both on economic growth in the shortrun is negative as revealed by the impulse response graph in Appendix D.

The effect of democracy on the growth of GDP is positive and significant. This support studies of Rodrik (1999), Lake and Baum (2001), Bhagwati, (2002) Kruzman et. al, (2002) Baum and Lake (2003) Keskin, (2011) that democracies affect the quality of administration positively, limit state intervention in the economy, responsive to public's demands on areas such as education, justice and health, and encourage stable and long-run growth. However, the effect of democracy on economic growth is positive but insignificant when it interacts with the foreign portfolio investment. Thus, democracy has positive but not significant effect on the relationship between foreign portfolio investment and economic growth. By implication democracy has significant and positive effect on the growth of the economy but has not succeeded in mobilizing enough foreign portfolio investment to enhance economic growth.

Table 9 Fitness Statistics of the Growth Model	
R-squared	0.875389
Adj. R-squared	0.728122
Sum sq. resids	24.10159
S.E. equation	1.480221
F-statistic	5.944234

R-Squared measure the amount of variation in the dependent variables explained by the explanatory variables in the model. In the growth model, about eighty- eight percent of the variance in the growth of GDP was jointly explained by foreign portfolio investment, domestic savings interest rate and democracy. When adjusted for the degree of freedom associated in the model, the adjusted R-Squared explained about seventy three percent of variation in the growth of GDP. The result suggests that our model captures, to a large extent, the relationship among the macro economic variables involved in Nigeria.

F statistics test the joint significance of the variables in the model, if significant; it implies the model has explanatory power with respect to the dependent variable. The critical value at five percent level of significance is 3.01 while the F- Statistics for the growth model is 5.9. Since the calculated F - Statistics value is greater than the critical F -Statistics value then sforeign portfolio investment, domestic savings, interest rate and democracy to large extent explain the growth rate of gross domestic product.

4.9 Impulse response analysis

In the shortrun, the effect of foreign portfolio investment on economic growth is negative; this is shown by the slope of the graph in Fig 1 in Appendix D. A shock on the foreign portfolio investment rate in the shortrun leads to a decline in the growth of GDP but this dies off in three (3) years to return to a level at which a shock on the foreign portfolio investment rate leads to an increase in the growth rate of GDP. A shock in foreign portfolio investment rate initially reduced the growth rate of the economy and thereafter started to increase after three years up to the sixth period. This result shows that the effect of rate of foreign portfolio investment on economic growth in the longrun is positive. This is in concordance with our findings in the VAR regression.

Also, the effect of domestic savings on economic growth in the shortrun is negative, as shown by the slope of the graph in Fig 2 in Appendix D. A shock on the domestic savings in the shortrun leads to a decline in the growth of GDP but this dies off in three (3) years to return to a level at which a shock on the domestic savings rate leads to an increase in the growth rate of GDP. A shock in domestic savings initially reduced the growth rate of the economy and thereafter started to increase after three years up to the fourth period. A unit shock on the rate of domestic savings has a negative effect on the rate of growth of the economy in the shortrun. The negative slope of the response of growth to unit shock in the domestic savings rate in the short run up to the third year can be justified by the fact that savings is a withdrawal from the economy. However this result shows that the effect of domestic savings rate on economic growth in the longrun is positive. This also corresponds with our findings in the VAR regression.

Moreover, the shortrun effect of interest rate on economic growth is negative though an initial shock leads to an increase in GDP for only a period, which thereafter leads to subsequent decline in GDP. This is also reflected in the slope of the graph in Fig 3 in Appendix D. A unit shock on interest rate leads to a decline in the growth of GDP up to the fourth period. Though, this effect dies off in the fourth period but to further follow the pattern in the subsequent periods. The result also shows that the longrun effect of interest rate on economic growth is negative. This also aligns with our a priori expectation and findings in the VAR analysis.

5 Conclusion, Policy Implications and Recommendations

This study has been able to establish the fact that Nigerian economy growth is endogenous. It has been able to establish that domestic resources are fundamental to the growth of the economy. It however establishes the supplementary role of foreign resources.

The study corroborates theoretical view of the relationship between economic growth and foreign resources. It reveals that foreign portfolio investment has positive and significant effect on the growth of the economy in the longrun. The result showed that in the long run foreign portfolio investment has significant impact on economic growth in Nigeria while in the shortrun, the impulse response and variance decomposition as well as V A R framework showed that there is negative relationship between foreign portfolio investment and economic growth in Nigeria. This result supports the view of Kaminsky and Schmukler (2001) that the benefits of FPI are long-term with some adverse effects in the initial stage of the process and that the long-term gains of FPI outweigh its short-term ill effects and bring real benefits to the growth and development of the domestic financial markets and the economy in general. This suggests that government should embark on such policies that will attract more foreign portfolio investment into the economy. Such policies as contained in the private investment promotion policy of the country should be fully implemented.

This study further establishes that interest rate is very essential to the growth of the economy. The growth of the economy required low interest, this then demand concerted monetary policy to regulate the interest rate in the economy. Low interest rate will encourage borrowing from monetary institutions, increase the volume of money in circulation, this will consequentially increase domestic savings and encourage domestic investment in the economy.

This study also finds a positive relationship between democracy and economic growth. It further detects positive relationship between foreign portfolio inflow, democracy and economic growth in the economy, though these relationships are not significant. It could be seen that our democracy is still juvenile, with vibrant socio economic and stable political environment, more foreign portfolio will be attracted into the economy and economic growth will be more stable.

The result suggests that for the country to achieve rapid economic growth objective in the shortrun, it should direct its policy towards other factors that can stimulate economic growth other than foreign portfolio investment. Such policies that ensure adequate domestic savings, appropriate incentives for investment and proper interest rate management that encourage capital flow into the economy will stimulate economic growth in the shortrun.

Nevertheless, to sustain this rapid economic growth objective, policies should also be directed to the effective utilization of resources in the economy. Mobilizing foreign portfolio investment is a necessary condition for economic growth as it provides resources for domestic investment but the sufficient conditions is the effective mobilization of domestic resources and ensure appropriate transmission of this domestic resources into investment. Therefore the recent transformation policy of the federal government of Nigeria should target macroeconomic stability, effective institutional settings, and investment friendly policies and discourage capital flight of any form in the country. More importantly, Nigeria democracy should be nurtured to maturity, devoid of electoral violence and malpractices which may adversely affect the system.

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APPENDIX A

Table 1 Foreign Portfolio Investment and Economic Growth (Pre Democratic Era)

Year	FPI(N BILLION)	GDP (N BILLION)	FPI % of GDP
1986	0.1516	73.062	0.207495
1987	4.3531	108.885	3.997888
1988	2.6118	145.243	1.798228
1989	-1.6188	224.797	-0.72012
1990	-0.4352	260.637	-0.16698
1991	-0.5949	328.115	-0.18131
1992	36.8518	620.077	5.943101
1993	-0.377	967.28	-0.03898
Average	5.1178	341.012	1.500768
1994	-0.2	1237.12	-0.01645
1995	-5.8	1977.74	-0.29251
1996	-12.1	2823.93	-0.42689
1997	-4.8	2939.65	-0.1628
1998	-0.6	2828.66	-0.02254
Average	-4.7	2361.42	-0.2
Sum	17.47538	14535.2	9.918145

Table 2 Foreign Portfolio Investment and Economic Growth (Democratic Era)

Year	FPI(N BILLION)	GDP(N BILLION)	FPI % of GDP
1999	1.0	3210.00	0.031
2000	51.1	4680.00	1.092
2001	92.5	5340.00	1.732
2002	24.8	7130.00	0.348
Average	42.4	5090.00	0.833
2003	23.6	8740.00	0.270
2004	23.5	11700.00	0.201
2005	-64.1	14700.00	-0.436
2006	165.7	18700.00	0.886
Average	37.2	13500.00	0.276
2007	100.6	20900.00	0.481
2008	-403.3	24600.00	-1.639
2009	-51.4	25100.00	-0.205
2010	388.7	34400.00	1.130
Average	8.6	26200.00	0.033
2011	544.7	37800.00	1.441
2012	2,361.3	41200.00	5.731
2013	2121.436	81100.00	2.616
Average	1,675.8	53400.00	0.031
Total Average	358.7		
Total sum	5380.2		

Sources: WDI database, CBN Statistical Bulletin

Table 3 Foreign Portfolio Investment and Growth Correlations

Covariance Analysis: Ordinary

Sample: 1986 2013

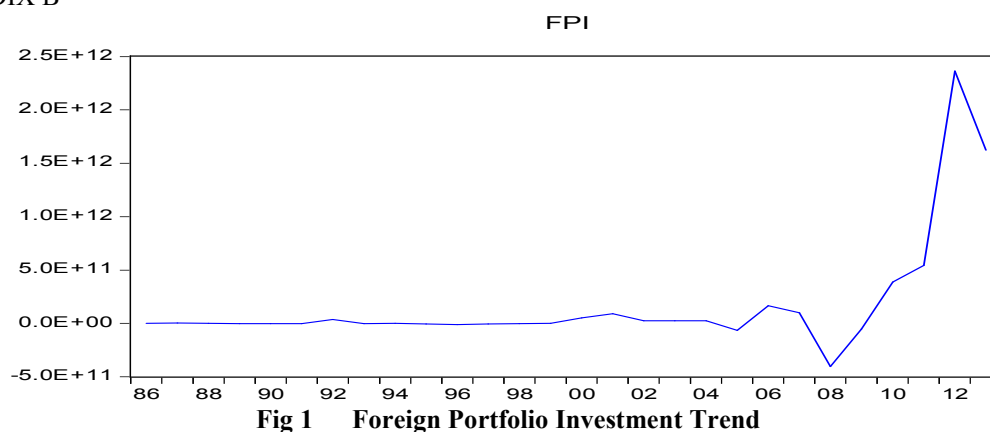
Included observations: 28

Correlation		
t-Statistic		
Probability	SER01	SER02
FPI	1.000000	

GDP	0.776230	1.000000
	6.278073	-----
	0.0000	-----

Sources: WDI database, CBN Statistical Bulletin

APPENDIX B



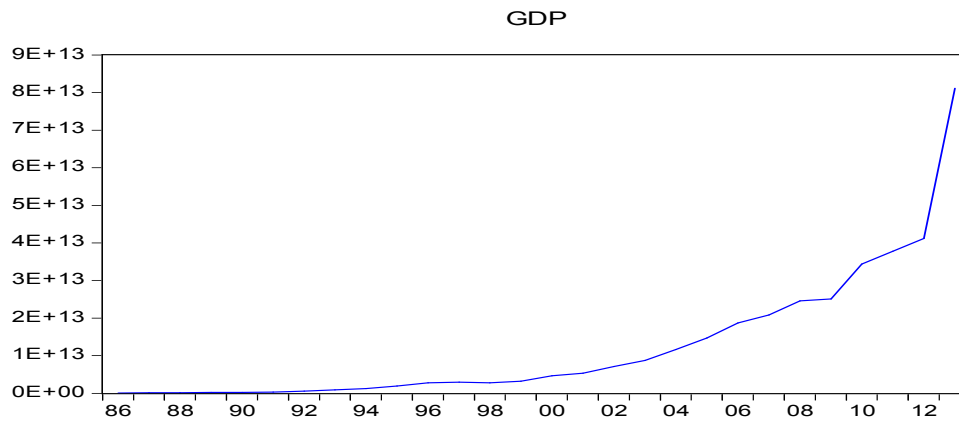


Fig 2 Trend of Gross Domestic Product
GDP

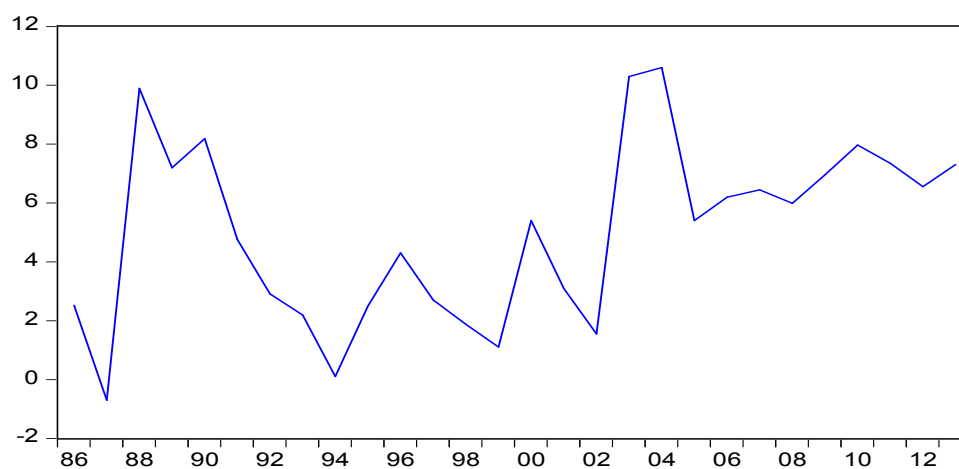


Fig 3 Trend of GDP Growth

Sources: CBN Statistical Bulletin

APPENDIX C

Table 4 Unit Root Test						
Variables	Augmented Dickey Fuller Test			Phillip Perron Test		
	Lag	Level statistics	Probability	Level statistics	Probability	Lag
GDP	0	-3.26**	0.027	-3.28**	0.029	0
FPI	0	-4.94*	0.0005	-4.94*	0.0005	0
DS	0	-3.74*	0.009	-3.75*	0.009	0
Int	0	-4.22*	0.0029	-4.28*	0.0025	0

1% Critical Value (-3.70)* 5% Critical Value (-2.98) **

Table 5 Unrestricted Cointegration Rank Test (Trace)

$H_0: r \leq k$	Eigenvalue	Trace Statistic	Prob.
0	0.546486	51.94263	0.0197
1	0.401267	31.38369	0.0326
2	0.352704	18.04724	0.0202
3	0.228310	6.738491	0.0094

Table 6 VAR Lag Order Selection Criteria

Endogenous variables: GDP FPI DS INT Exogenous variables: C D1 D1F

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-252.2333	NA	17886.60	21.13867	21.72373	21.30094
1	-237.7896	20.79896	21442.23	21.26317	22.62831	21.64180
2	-228.4030	10.51306	44292.69	21.79224	23.93746	22.38723
3	-173.4151	43.99030*	3187.129*	18.67321*	21.59851*	19.48456*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Sources: E Views 8 Computation

Table 8 VAR Residual Serial Correlation LM Tests

Null Hypothesis: no serial correlation at lag order h

Sample: 1986 2013

Included observations: 25

Lags	LM-Stat	Prob
1	27.89937	0.0325
2	21.87426	0.1473
3	16.78619	0.3996
4	23.35175	0.1046
5	24.61544	0.0769
6	12.40368	0.7158
7	12.01036	0.7433
8	7.004991	0.9732
9	29.52931	0.0206
10	20.16868	0.2127
11	7.647541	0.9587
12	4.067922	0.9988

Probs from chi-square with 16 df.

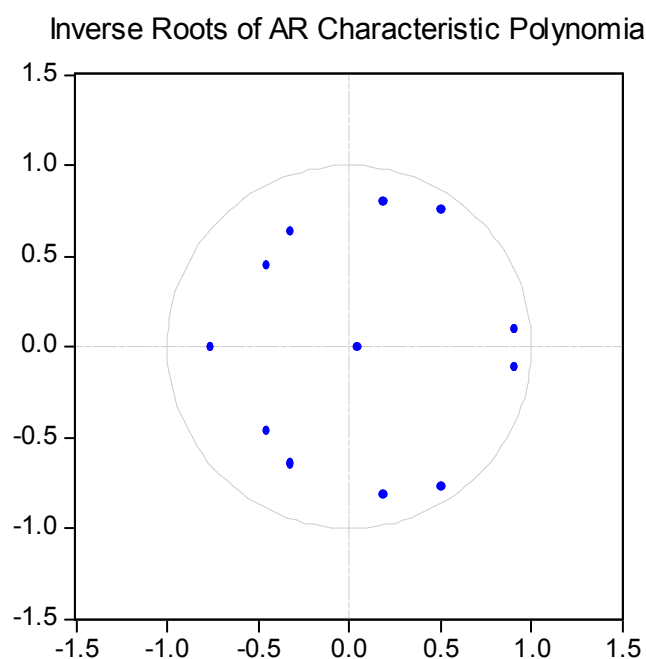


Fig 4

Table 7 Tests for Long-Run Weak Exogeneity

(H_0 : Variable is weakly exogenous to cointegrating vector)

Variables	Chi-sq	Prob.	Decision over H_0	Inference
GDP	35.62789	0.0000	Rejection	Not exogenous
FPI	23.40811	0.0053	Rejection	Not exogenous
DS	3.843814	0.9214	Acceptance	Exogenous
INT	33.56055	0.0001	Rejection	Not exogenous

Table 9 VAR Residual Normality Tests

Orthogonalization: Cholesky (Lutkepohl)

Null Hypothesis: residuals are multivariate normal

Sample: 1986 2013

Included observations: 25

Component	Skewness	Chi-sq	Df	Prob.
1	0.072804	0.022085	1	0.8819
2	0.476575	0.946348	1	0.3307
3	0.385544	0.619349	1	0.4313
4	0.317908	0.421106	1	0.5164
Joint		2.008888	4	0.7341
Component	Kurtosis	Chi-sq	Df	Prob.
1	2.347927	0.442916	1	0.5057
2	2.786710	0.047388	1	0.8277
3	2.895765	0.011318	1	0.9153
4	2.934837	0.004423	1	0.9470
Joint		0.506045	4	0.9729
Component	Jarque-Bera	Df	Prob.	
1	0.465001	2	0.7925	
2	0.993736	2	0.6084	
3	0.630667	2	0.7295	
4	0.425529	2	0.8083	
Joint	2.514933	8	0.9610	

Table 10 VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Sample: 1986 2013

Included observations: 27

Joint test:					
Chi-sq	Df	Prob.			
122.5021	110	0.1956			
Individual components:					
Dependent	R-squared	F(11,15)	Prob.	Chi-sq(11)	Prob.
res1*res1	0.639419	2.418136	0.0568	17.26430	0.1003
res2*res2	0.390980	0.875430	0.5802	10.55646	0.4811
res3*res3	0.129248	0.202409	0.9945	3.489705	0.9825
res4*res4	0.426975	1.016078	0.4773	11.52832	0.4001
res2*res1	0.625144	2.274123	0.0701	16.87889	0.1115
res3*res1	0.460968	1.166153	0.3826	12.44615	0.3311
res3*res2	0.682539	2.931806	0.0277	18.42855	0.0722
res4*res1	0.596463	2.015573	0.1032	16.10450	0.1373
res4*res2	0.298975	0.581568	0.8159	8.072330	0.7068
res4*res3	0.684750	2.961929	0.0266	18.48824	0.0709

APPENDIX D

Fig 1 Accumulated Response of GDP to FPI

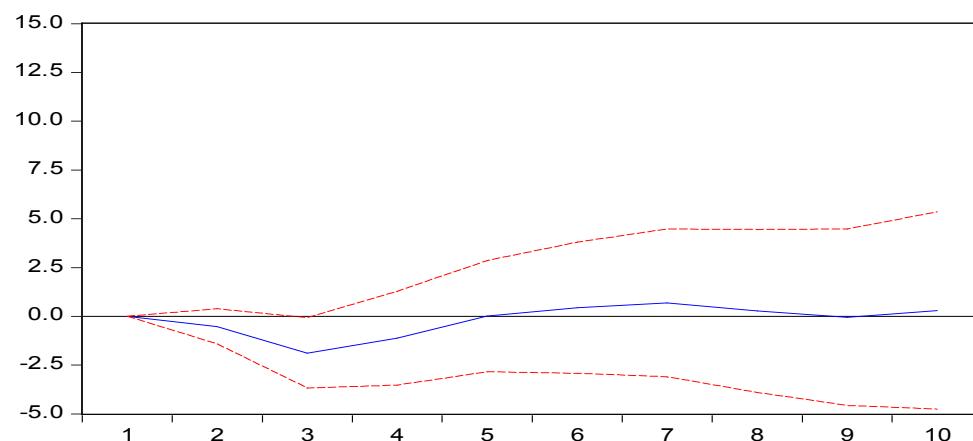


Fig 2 Accumulated Response of GDP to DS

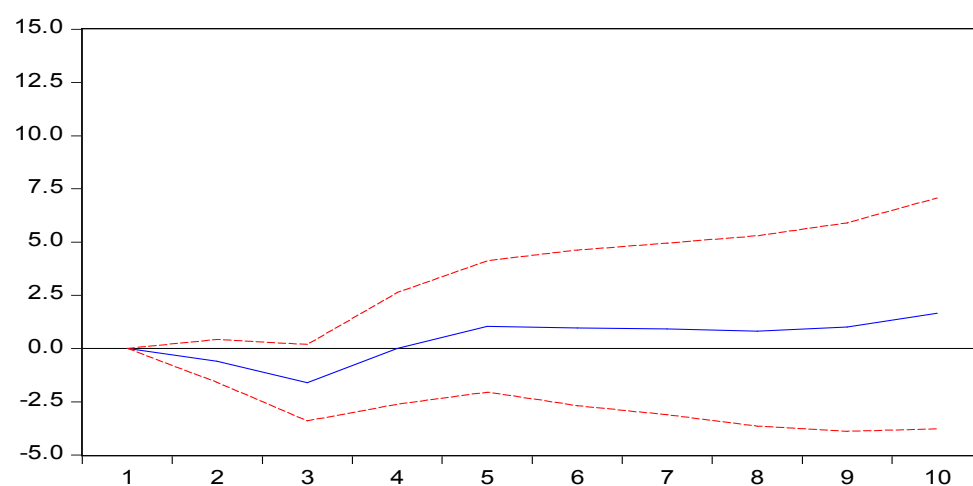


Fig 3 Accumulated Response of GDP to INT

